

## STEM Learning Exchange Engagement in Schools and Districts

Since January 2013, the STEM Learning Exchanges have increased their effort to build their networks of support and reached out to districts and schools to create coalitions of interest and investment around sector specific “cluster” areas. The Learning Exchanges (or “Exchanges”) are working with approximately **194 schools** (taking account for sector overlap in schools) and are meaningfully engaged and developing Career Pathway Systems for over **17,500 Illinois students**.

Each STEM Learning Exchange is developing a network of statewide partnerships (between schools, industry, state government, and non-profits) that better coordinate investments, resources, and planning in industry areas that are crucial to economic development in Illinois and better utilize industry and public resources. The Exchanges are focused on delivering resources and supports for local pathway systems, to help local schools make clearer and more comprehensive connections with e-Learning and curriculum resources, lab space and equipment, teacher development, and student organizations that foster engagement between schools and the workplace. To that end, the Exchanges are simultaneously focused on expanding work-based learning opportunities for students and communities, to facilitate more job-shadowing and internship opportunities, as well as industry sponsored challenges which directly engage students with industry leaders.

This document highlights some of the accomplishments of the STEM Learning Exchanges in the past year, with a focus on the crucial connections that the Exchanges made between schools and districts and their industry partners.

### Measures of STEM Learning Exchange Engagement in Schools across Illinois

STEM Learning Exchange	# of Schools Exchange Meaningful Engagement	# of Students, Exchange Meaningful Engagement (based on 10% engagement)
Manufacturing LE	29	4093
Agriculture LE	80	3676
Energy LE	23	597
R&D LE	13	2701
Health Science LE	20	2600
IT LE	29	4194
<b>Total</b>	<b>194</b>	<b>17862</b>

# ILLINOIS Pathways

Science, Technology, Engineering & Math



ILLINOIS  
STEM Learning Exchanges

Since 2012, the Illinois Manufacturers' Association, which is the lead entity for the **Manufacturing Learning Exchange**, has engaged in comprehensive community outreach across the state, visiting each of the State's 48 Community Colleges, their numerous feeder high schools, and local manufacturers to develop relationships that have resulted in viable internships for students (with an anticipated expansion to over 500 additional internships by July 2014), externships for faculty, and program sustainability. The Exchange is establishing a Web-based library of comprehensive e-Learning materials from credentialed programs in a password protected environment that is end-user friendly and will be housed in the "Dream It-Do It" website. Additionally, this Exchange has worked with student organizations to support industry sponsored student-challenges and education competitions in machining, robotics, and/or welding in at least 4 regions by July 2014. Including its Race to the Top schools, the Manufacturing Learning Exchange is meaningfully engaged with approximately **29 high schools**.

The **Agricultural, Food, and Natural Resources Learning Exchange** is by far the most developed Learning Exchange, because of the State's longstanding focus on agricultural education, and is engaged in a meaningful way in **80 high schools** across the State. Since 2012, Learning Exchange has focused on building upon a successful model of Illinois agriculture education coordination, by combining the efforts of the Illinois FFA Association, the Illinois Leadership Council for Agricultural Education (ILCAE), and the Facilitating Coordination in Agricultural Education (FCAE) to create an infrastructure that can support coordination on student college and career development. This Exchange has focused heavily on increasing Supervised Agricultural Experience grants to schools across the State, focusing on providing workshops, resources, and mentorships for both students and teachers, and increasing resources to diverse groups, such as Illinois Agri-Women.

The **Energy Learning Exchange**, led by Illinois State University, has been capitalizing on increased attention to energy-related careers by leveraging existing partnerships with the Illinois energy education network, academic resources, and long-term business relationships to create an infrastructure that can support coordination on student college and career development. The Exchange is focused on cataloging existing Energy-related curriculum and lesson plans to be shared openly and easily with schools via the Illinois Shared Learning Environment ([www.ilsharedlearning.org](http://www.ilsharedlearning.org)). The Exchange is also creating an online toolkit of workforce development and career programs for educators and employers which will help teachers, guidance counselors, and workforce development professionals become familiar with energy careers and energy career programs. The Exchange also sponsored "Careers in Energy Week" and is hosting a series of professional development workshops during the 2013 and 2014 summers called *Teaching Next Generation Energy Concepts with Next Generation Science Standards*, which includes a 2 week professional development workshop and follow up days throughout the school year. The Exchange is working intensely with approximately **23 high schools** across the State.

The **Research and Development (R&D) Learning Exchange**, led by the Illinois Science and Technology Institute, has taken a “pilot” model approach to school engagement and is working intensely with **13 high schools** across the state to pilot R&D focused initiatives aimed at facilitating and sponsoring real-world applications to complex, industry-driven problems. Students work on variety of topics including: food safety, aerospace and defense, environmental sustainability, and behavioral economics. Students work in teams to project manage and apply what they learn in science, technology, engineering, mathematics, and social science to solve complex issues over the course of a semester. As part of this effort, the Exchange has focused on linking schools with an industry sponsored Resource Repository, where students and teachers can seek out resources (internships, professional development opportunities, curricula, and events). Additionally, the Exchange is also developing and piloting the Mentor Matching Engine, which matches students with industry leaders in an unprecedented guided and meaningful way. These mentorships are “problem-oriented”, in that students are driven to find mentors based on the real-world problems they want to solve.

CompTIA, the lead entity for the **Information Technology Learning Exchange**, is focused on comprehensive community outreach to create a sustainable model for public-private engagement in the Information Technology sector. CompTIA has also successfully participated in several IT grant opportunities, including the Gates Foundation Scales Models for Certificate Delivery, which is aligned with its goal and strategy for long-term sustainability. The Exchange is focused heavily on working with industry partners to create online model lesson plans aligned with the Illinois IT Programs of Study, providing resources for in-service teacher training, and creating a comprehensive and continuously updated library of career development/exploration and outreach resources. The Exchange is meaningfully engaged in **29 schools** across the State, which include **5 STEM Academies** in the City of Chicago, and an **additional 31 CPS Schools**.

**The Health Science Learning Exchange**, led by the University of Illinois at Chicago, has been focused deeply on building membership networks and technical support, as well as expanding physical resources with education and industry partners. The Exchange has engaged with **20 high schools** and also engaged with industry partners to create a “Speaker’s Bureau”, which allows students live, virtual access to experts in the field, both in the classroom and as part of their personal career exploration. The Exchange is working with schools to consolidate and add to the existing library on career exploration and to ensure that access to this technology is broad enough that all students are able to utilize this resource. The Exchange has established a relationship with the IJAS, and for the 2013-2014 school year, the Exchange is seeking to pilot this partnership through the Aurora and Chicago Public Schools. The Exchange is working with IJAS to support collaborative scientific research, improve high school faculty mentorship, and provide better access to labs and equipment, qualified judges from employers, and facilities for student use. Finally, the Exchange has worked to develop foundational and up-to-date curriculum that is informed by educators at the University level as well as individuals from industry, as well as providing funding for a curriculum designer/manager to work with respective



schools to improve their existing curricula and lesson plans. This improved curriculum will be shared openly through the Illinois Shared Learning Environment ([www.ilsharedlearning.org](http://www.ilsharedlearning.org)).

Collectively, the STEM Learning Exchanges have engaged with over **210 schools**, and continue to work in concert to develop collective communication, fundraising, and regional engagement initiatives. The Exchanges, working with the support of the Illinois Business Roundtable and Northern Illinois University, have fostered deeper engagement with the Illinois Pathways Interagency Committee and Advisory Council, which has led to clearer coordination and role definition between the Exchanges and the Pathways Resource Center. The Exchanges are more clearly aligned with the efforts of the Illinois Shared Learning Environment, and most have moved deeply into the implementation phase.